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Estimate of white-coat effect and arterial stiffness.

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Abstract

OBJECTIVES: Blood pressure (BP) measured in the office is usually higher than the average ambulatory BP, a difference generally taken as an estimate of the white-coat effect. This study was designed to assess whether such a difference is associated with impairment of the conduit arterial system.

METHODS: We calculated the difference between office and average daytime peak systolic blood pressure (DeltaSBP) in 2778 hypertensive participants (1240 women) of the Progetto Ipertensione Umbria Monitoraggio Ambulatoriale cohort. Arterial stiffness was evaluated using an adjusted office pulse pressure to stroke volume ratio (PP/SV), measured at rest, which has previously been shown to predict cardiovascular outcome independent of echocardiographic left ventricular hypertrophy. Effective arterial elastance was also estimated.

RESULTS: Across quintiles of PP/SV, significant linear, positive trends were found with age, the proportion of women, plasma glucose and triglyceride levels ($0.05 > P < 0.0001$). Heart rate measured in the office increased mildly with quintiles of PP/SV ($P < 0.05$). After adjusting for age, sex, body weight and office heart rate, DeltaSBP progressively increased with increasing quintiles of PP/SV (P for trend < 0.0001), whereas stroke volume decreased, paralleling the increase in left ventricular relative wall thickness (both $P < 0.0001$) and left ventricular mass index ($P < 0.05$). The significant increase in effective arterial elastance with quintiles of PP/SV was also independent of peak systolic BP, in addition to age, sex, heart rate and body weight.

CONCLUSIONS: The difference between office BP and ambulatory BP, an estimate of the white-coat effect, is strongly associated with increased arterial stiffness, evaluated by a two-element fluid system accumulator.

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